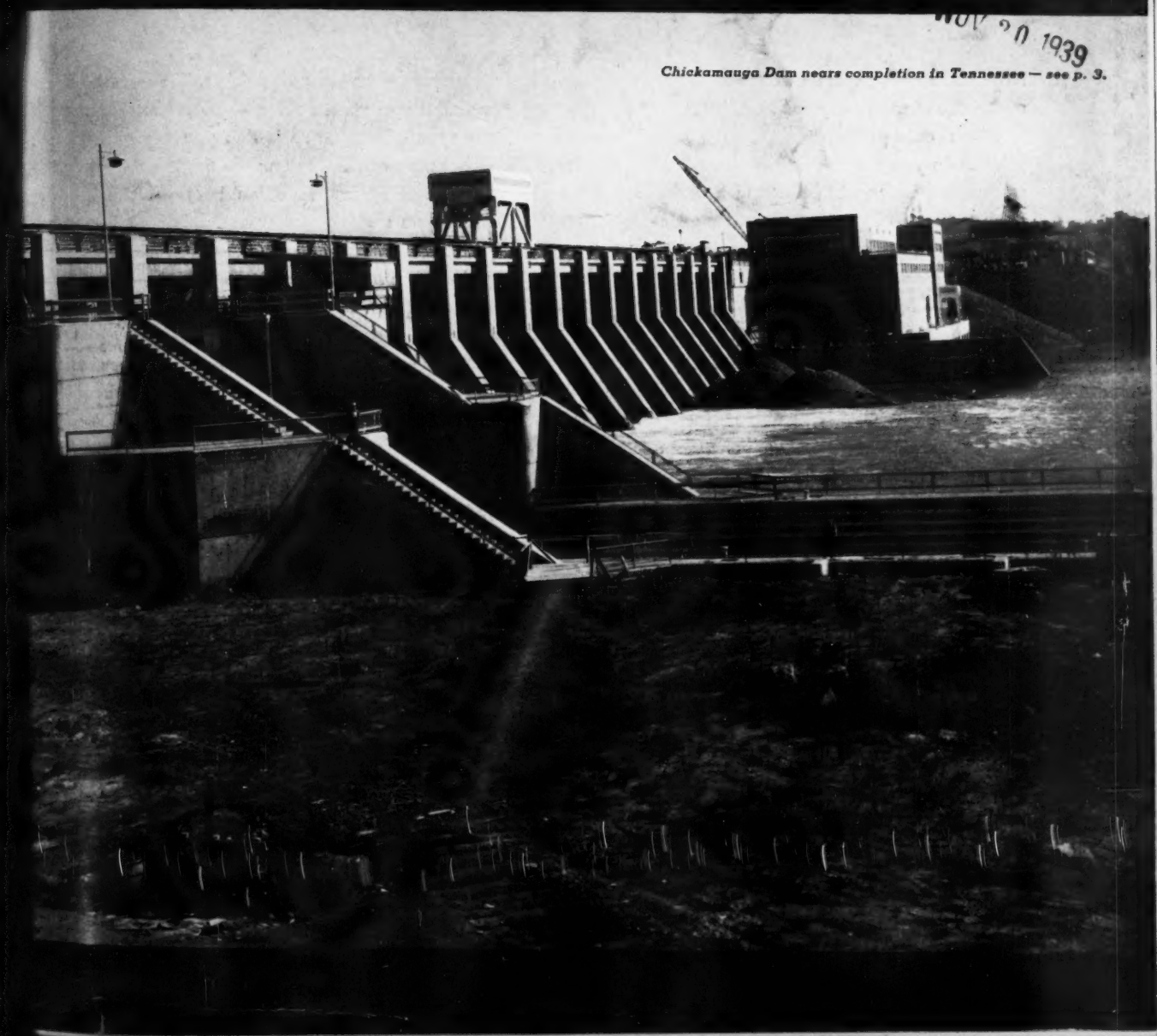
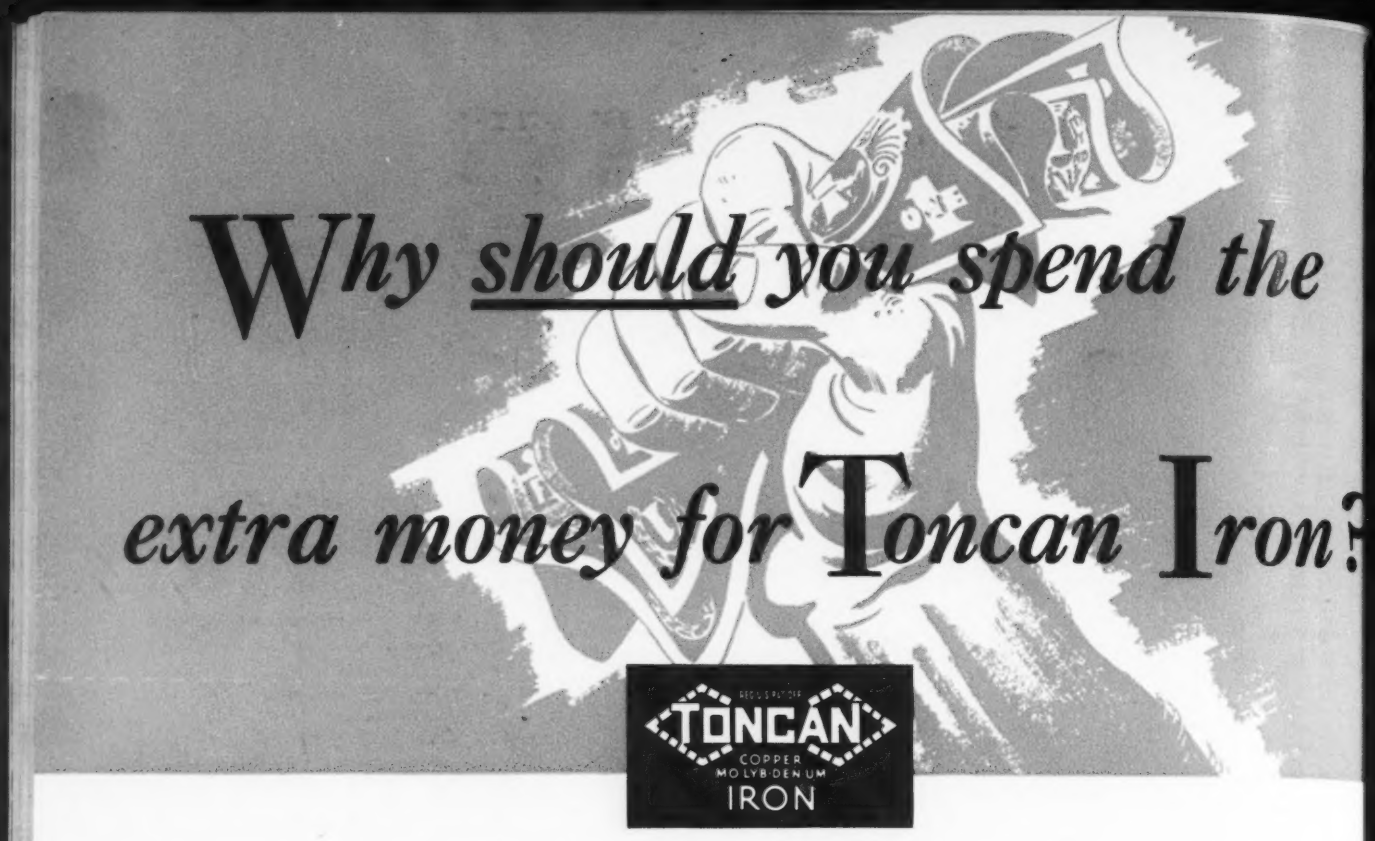
NEWS

NOV 20 1939



Chickamauga Dam nears completion in Tennessee — *see p. 3.*



Why should you spend the extra money for Toncan Iron?

TONCAN
COPPER
MOLYBDENUM
IRON

Republic salesmen are often asked, "Why should I spend the extra money for Toncan Iron?"

Why should you?

Why do you drive your car to the office every day, when the walk would be so much cheaper and more healthful? You save time — and time is money.

Why do you scrap an old machine that still runs, and then spend thousands of dollars for a new one to do the same job? Because it cuts your maintenance costs and your cost per piece.

Why should you spend the extra money for Toncan Iron? The answer is the same — it saves you time in fabrication because of its uniform ductility. It reduces your installation time. It cuts your maintenance cost, because it resists rust to a higher degree than any other ferrous metal in its price class.

Like several other companies, we, too, make pure irons, carbon steels, and copper-bearing irons and steels. But only Republic makes Toncan Iron — the alloyed pure iron base containing molybdenum and twice as much copper as any other commercial copper-bearing ferrous metal.

So, we are in an unique position. We can sell you any material you want to buy — but, when we see that the type of service to which you are going to put either pipe or sheets demands the extra corrosion-resistance of Toncan Iron, we'll recommend it and be doing you a favor when we do. It isn't a matter of profit to us, but to you, because it costs us more to make this alloy. Molybdenum isn't cheap, you know, and alloy making requires greater skill and longer heats in the open-hearth furnaces.

There are certain types of service in every building, in every ship, in every industrial plant, where sheets and pipe made of Toncan Iron will delay maintenance and repair expense for years beyond when you would normally expect them if you used a slightly less expensive material. And that's why you should lean on Republic for advice, and sometimes spend profitably the little extra that buys the protection that only Toncan Iron can give you.

May we send you literature outlining scores of actual service records? Just tell us whether you are interested in pipe or sheet applications.

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An alloy of refined open-hearth iron, copper and molybdenum
—that grows old slowly

ENGINEERING NEWS-RECORD

NEWS

Volume 123 NOVEMBER 16, 1939 Number 20

NOTES ON THE NEWS

Quick Surveys of Construction Events

▶Encouraging news for the construction industry is found in the fact that private contract awards as recorded in the Construction Reports pages of this issue are ahead of last year for the 10th consecutive week. Real revival of the industry depends on a revived private construction market.

▶Highway engineers of Arizona have been told that they will be fired if they join a union. With the Wagner Labor Relations Act now on the federal statute books this looks like the makings of a good fight to determine whether the act applies to state employees.

▶Over 122 million cu. yd. of earth had been pumped into Fort Peck Dam when the dredges completed their job last week.

▶An unusual bridge erection accident occurred at New York last week when a guy derrick, in toppling forward from an as yet undetermined cause, pulled most of the erected portion of a girder span after it. The accident again emphasizes that erection loads are usually the most severe that a bridge has to resist.

▶Chicago celebrated the 50th anniversary of the establishment of its Sanitary District last week by opening the Southwest Sewage Treatment Plant, the largest of its kind in the world. A population of 4,700,000 now being served by sewage treatment, attention is being turned toward water purification as the final step in Chicago's great sanitation program.

▶Army engineers sent to Nicaragua to report on a barge canal to Lake Nicaragua are back in this country but will not be ready to report until further studies have been made. The earlier surveys for a ship canal were found to be of little value in the barge canal work.

Water Bureau Engineers Strike in Chicago

Twenty-three engineers working in the engineering division of the Chicago water bureau struck Nov. 8, refusing to work longer alongside nine engineers who would not join Local 14 of the Technical Engineers', Architects' and Draftsmens' Unions (A.F.L.). The non-union men are regular civil service employees in a staff at work on waterworks improvements, not members of the special staff of 75 designing the filtration plant. The engineers were called out by James Gilboy, business agent. No picketing has been established according to Loran D. Gayton, city engineer, who indicated that the civil service status of the non-union men made it impractical for him to require the nine to affiliate with the union. He has passed the problem to Oscar E. Hewitt, commissioner of public works.

All striking engineers returned to work Nov. 13 following notice from Hewitt that suspensions and loss of pay would be imposed unless they returned to work.

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Higher Suburb Water Rates Upheld at Milwaukee

A dispute of long standing over water rates to be paid Milwaukee by the suburb of West Allis has been decided in favor of the former by a circuit court judge. In 1921 rates were raised from 6c. to 10c per 100 cu. ft. and West Allis refused to pay the increase. In 1930 the city began billing the suburb at the higher rate. The judge granted the 10c. rate to July 1932 when the city reduced it to 9c. which the judge cut to 8½c. until Dec. 31, 1935 and to 8c. since that time.

The main point of general interest is the recognition that higher rates to suburbs are reasonable since water users outside of the city pay no taxes for waterworks development and do not contribute to the burden and risk of operation.

Nicaragua Report Not Expected Soon

Studies for shallow-draft barge canal to require a year according to army engineers

No report on the Nicaraguan shallow-draft barge canal is expected for a year or more. The board of army engineers, headed by Lieut. Col. Charles P. Gross, which recently returned from a three-month investigation (*ENR*, Nov. 9, 1939, p. 603) merely made preliminary studies to find out how much information would be required. Two members of the party, Lieut. W. B. Bunker and E. E. Heyler, are staying in Nicaragua to carry out the surveys.

The project being studied involves canalization of the San Juan River to give access from the Atlantic Ocean to Lake Nicaragua. This large naviga-

(*Continued on p. 2*)

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Highway Builders Affected By New Nebraska Law

At the last session of the Nebraska legislature a law was enacted wherein bidders for highway construction must be prequalified by the Department of Roads and Irrigation. The bidders are required to apply to the above department a week before the contract letting date. The department will then study the record of the applicant before issuing a permit for bidding.

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Oklahoma City May Get $4,350,000 Improvement

A $4,350,000 improvement to the city's water supply system is being considered at Oklahoma City. Known as the upper Bluff Creek plan, it calls for spending $1,500,000 for a pumping and filtration plant, $1,200,000 for expanding the present distribution system and $306,000 for improving the present Lake Overholser unit.

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Powers of Owner's Agent Upheld by Supreme Court

The U. S. Supreme Court last week reversed a court of claims decision in favor of John McShain, Inc., who had been refused extra expenses incurred in obtaining a better grade of gravel used in the construction of the Internal Revenue Building in Washington. The Secretary of the Treasury refused to allow the extra amount and the contractor had taken the case to the court of claims. When the decision in that court was against the government, the case was taken to the Supreme Court.

The government contended that the question was one of pure fact which officers should be able to settle outside the courts as provided in the contract. The company contended that the matter was one involving questions of law and not of fact, a question which the contracting officer had no authority to decide.

The government further contended that its contracting officer was denied by the lower court his rightful authority "to interpret" the contract.

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Michigan Materials Tax Held in Abeyance

Ruling of the Michigan State Board of Tax Administration, which would have required contractors to pay a 3 per cent sales tax on all materials used in construction work for the federal, state or local governments, did not go into effect Nov. 1, as originally proposed. The date of commencement has been extended indefinitely by the board following a public hearing.

Contractors protested that such a tax would greatly increase the amount of construction done by force account, as purchases by governmental agencies are specifically exempt from the tax. They also argued that the tax would force many contractors out of business due to the fact that a considerable portion of the work during past years has been public construction.

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Susquehanna River Held Navigable

The Federal Power Commission has ruled that the Susquehanna River at the site of the Holtwood water power project of the Pennsylvania Water & Power Co. is navigable and has ordered the project to be licensed, 30 days being allowed for filing application.

Special importance is attached to the opinion in that it sets a precedent to be followed by the power commission under which hydro-electric projects found to be subject to the provisions of the Federal Power Act will be compelled to obtain such licenses.

The Holtwood development is between the Conowingo plant, owned by the Susquehanna Power Co. and the Philadelphia Electric Co., and the Safe Harbor plant owned by the Safe Harbor Water Corporation. There is no navigation up or down the river and there are no locks at the dams.

• • •

Posthumous Medal Award To C. F. Hirshfield

The 1940 John Fritz gold medal has been awarded to the late C. F. Hirshfeld, who until his death on April 19 was chief of the research department of the Detroit Edison Co. The medal is given for notable scientific or industrial achievement by a board composed of 16 representatives of the four national societies of civil, mining and metallurgical, mechanical and electrical engineers.

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Road Employees' Insurance Studied in North Dakota

The North Dakota State Highway Department is considering a plan for blanket liability insurance to protect its employees in cases of accidents involving highway crews. The policy would cover death, personal injury and property damage. If a majority of employees favor the plan, a group policy may be issued covering those workers who operate equipment owned by the department.

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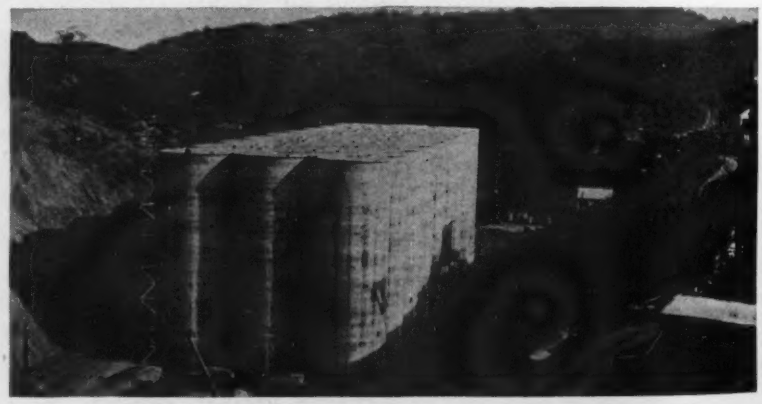
Nicaragua Report

(*Continued from p.* 1)

ble lake provides transportation for the relatively undeveloped central portion of the country. It is possible that a channel will be cut from the lake to the Pacific; this is being studied, but it is clear that deep cuts would make the cost high.

A large part of the proposed route was surveyed in connection with previous studies of a ship canal across Nicaragua. The ship canal route, however, left the river in numerous places, and this would not be economic for a barge canal. It is therefore necessary to survey and gage the river at these points. The exact route at the ocean end has not yet been determined. It is decided that the terminus will be at Graytown—a ghost town of about 300 people with a badly silted harbor. This will involve a cutoff from the San Juan, and any one of several small rivers might be followed.

Costs will be determined for a 12, a 10, and probably an 8 and a 6-ft. channel. The work is being done for Nicaragua with a special appropriation of $100,000.



CEMENT SILOS THAT WERE BUILT IN RECORD TIME

CEMENT for Shasta Dam will be stored at the mill, 45 mi. south of San Francisco, in 27 silos (three rows of nine) 30 ft. in diameter and 90 ft. high which were recently erected in less than two months. The concrete walls are 9-in. thick at the base; 20 ft. above that level the thickness decreases to 7 in. The roof slab is 6-in. thick. A total of 12,000 cu.yd. of concrete was used, including foundations. Wall forms were in sections 4-ft. high arranged to be jacked up a few inches at a time so that form movement could be almost constant and pouring could be continuous throughout three shifts daily. Forms for supporting the roof were put together on the foundation before the wall pouring began; they went up with the walls and served as a work platform during construction. Henry J. Kaiser is president of the Permanente Corporation that will manufacture the cement; the silos were built by the Rust Engineering Co., contractors of Pittsburgh, Pa.

Arizona Highway Engineers Not Allowed to Unionize

Instructions have been issued threatening dismissal of any employee of the engineering division of the Arizona highway department engaging in union activities. Employees have been studying the formation of a union to be affiliated with the Technical Engineers', Architects' and Draftsmen Unions (A.F.L.) and about 30 employees, who had signified their intention of becoming members of the Phoenix Local, resigned when faced with a dismissal order.

Discouraged by the action on the part of representatives of the American Association of Engineers and the American Society of Civil Engineers who appeared before the state highway commission, the employees turned to the T.E.A.D.U. The latter group promised to send a field organizer when the Phoenix local completed its affiliation with the national group. Before the application for affiliation could be completed, the "no union" order was issued.

At a meeting of the salary committee of the Arizona Section, A.S.C.E., a resolution protesting the treatment given the engineering employees of the highway commission was drawn up. Failure to classify employees, signing blank payrolls and demanding "cash only with no receipt" payments from employees are practices condemned.

TVA Photo

CHICKAMAUGA POWER

INSTALLING the shaft and wheel in generating unit No. 3 at TVA's Chickamauga Dam. This project, now nearing completion on the Tennessee River a few miles above Chattanooga, will have an initial generating capacity of 81,000 kw. The dam, shown on the cover of this issue, will be 108 ft. high and 5,794 ft. long, with a reservoir area of about 36,500 acres reaching 59 mi. upstream. The cover picture shows a portion of the navigation lock in the foreground. Atop the spillway section is the crane used in moving the gates.

Here shown is one of the three 36,000-hp. movable-blade runners now being installed.

DREDGES COMPLETE A FIVE-YEAR JOB AT FORT PECK DAM

THE FIVE-YEAR JOB of placing more than 122,000,000 cu. yd. of hydraulic fill in Fort Peck Dam was completed on Nov. 5 as the dredges stopped pumping into the upstream toe berm. This air view, taken from high over the east abutment, shows the dam in its almost completed state. The top 25 ft. of the dam will be finished with rolled fill taken from the downstream face. In the foreground are the control works for the four tunnels, two of them complete.

Hydraulic Filling Ended At Ft. Peck

Dredges shut down Nov. 5 after pumping 122 million yards into Missouri River barrier

On the morning of Nov. 5 the 28-in. hydraulic dredges *Jefferson* and *Missouri* pumped the last of 122,178,000 cu. yd. of hydraulic fill into Fort Peck Dam on the Missouri River in northeastern Montana, completing, except for dry-fill topping out, the greatest earth dam in the world. During the 1939 dredging season the two units pumped 13,694,000 cu. yd. into the slide area in the upstream face and into a berm placed at the upstream toe to stabilize the fill. At times each dredge pumped through 6½ miles of 28-in. pipeline over a lift of 228 ft. with the aid of eight booster pumps in addition to the two pumps on the dredge. Dredging at Fort Peck started in October, 1934, upon the completion of the first of four dredges built at the site. Placing of the embankment was planned to have been completed last year, but on Sept. 22, 1938, a 5,000,000-yd. section of the upstream face near the east abutment slid into the partly-filled reservoir. Only two of the four dredges were utilized for the slide repair and additional berm work this year.

Work remaining to complete the project includes topping out of the last 25 ft. of fill with material taken from the downstream face, reconstruction of the diversion tunnel intake structure, installation of control gates in the last two of the four tunnels and the building of a powerhouse at the outlet of one tunnel.

The Fort Peck project, which includes the dam, 250 ft. high and 9,000 ft. long flanked by a dike 11,000 ft. long, four diversion tunnels and a 2-mile spillway cut, is being built by the army engineers. Lt.-Col. Thomas B. Larkin was district engineer in charge for the first four years, succeeded by Maj. Clark Kittrell. C. S. Smith has been dam superintendent since the start.

• • •

Federal Government Begins Cleveland Building Probe

The Department of Justice last week started its drive against alleged restraints of trade in the building industry at Cleveland by indicting four labor leaders and five business men. The group was accused of unlawful procedures in the glazing trade, the federal grand jury charging that the group "engaged in an unlawful combination and conspiracy in restraint of trade."

A maximum penalty of a year in jail and $5,000 fine is possible in case of conviction.

Cleaning Coulee Concrete With Air, Water and Sand

CLEAN-UP CREWS on Grand Coulee Dam, before the job is finished, will have prepared about 55,000,000 sq.ft. of concrete surface for successive pours in the 5-ft. lifts. Because there is so much of this work and because such importance is attached to proper condition of the surface prepared for fresh concrete, the operation has been systematized to a high degree. In conjunction with the usual jets of air and water under high pressure, sand is being used on this job under a plan which facilitates injection of the sand into the jet through tanks regularly spaced beneath the deck of the overhead construction trestle.

The clean-up crew, usually consisting of three workmen and a foreman, is expected to scour two or two-and-a-half blocks per shift equaling 4,800 to 6,250 sq.ft. of concrete surface. The first operation ordinarily is with a hand shovel depositing the waste in a skip. Next a water jet from a ¾-in. hose (pressures up to 200 lb. per sq.in.) is started in one corner and the operator sluices waste material out toward an 8-in. drain hole in the center of the block. (The drain is protected by a screen to keep out scrap lumber or other waste.) After this first sluicing, the surface is ready for sand.

A jet in which sand is combined with compressed air and water may be used 60 hr. after the pour has been completed. Introduction of sand into the air-water jet greatly increases its effectiveness in removing laitance and any foreign material on the surface of the concrete.

Following the jetting with sand comes a third jet treatment in which water washes off the sand. This usually requires 2 hr. for a 50x50-ft. block as compared to the 1½ hr. for the jetting with sand. Sand from the jetting operation is sluiced into the central drain and carried out by the wash water. The fourth jet treatment, ordinarily the last, is an air blast used to blow away any water that may remain in low spots.

Improvements in the sand system and design of the "washout guns" were worked out by the staff of the Consolidated Builders, Inc., contractor on Grand Coulee Dam.

A JET OF AIR OR WATER, or a combination of both, is used to clean up after the sand blasting operation.

IN THE GUN designed to use sand, the large hose bringing air and sand comes in at the rear and goes in a straight line through to the 1-in. outlet nozzle. Admixture of water takes place close to the nozzle, thus allowing the sand to remain dry until reaching the point of discharge. The operator keeps well covered.

Work Progresses on Yakima Project

WORK is in the final stage at Roza Diversion Dam on the Yakima River in Washington. Headworks at the left will direct water to the 87-mi. Yakima-Ridge Canal to irrigate a 72,000 acre strip of fertile arid land in Yakima and Benton counties. The concrete dam is 55 ft. high and 263 ft. long. Roller gates are 110 ft. long and 15 ft. diam. The dam is notable in that it is the smallest structure to be equipped with this type of gate. Note fish ladder at lower right. Morrison-Knudsen Co., Boise, Idaho, is contractor on the dam.

AKIMA-RIDGE CANAL. Open sec-n, tunnel, flume and siphon will ry water diverted at Roza Dam 87 . to irrigate arid land. In this view shown a transition from a typical ncrete lined section to an earth por-n of the canal. It is expected that e first delivery of water to irrigate 000 acres will be made in 1941.

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Partly Completed Bridge Wrecked When Derrick Falls

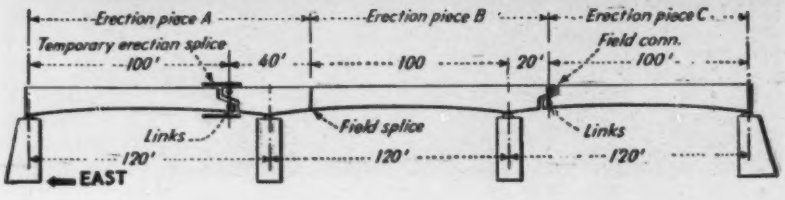
A CONSTRUCTION ACCIDENT of puzzling origin and unusually destructive result occurred in New York City on Nov. 6 when a 50-ton 120-ft. girder being hoisted by a guy derrick to its supports in the center span of the three-span Plum Beach Channel bridge on the new Belt Parkway dropped from a height of 60 ft. into the waters of Rockaway Inlet, dragging the derrick and a large part of the erected east shore span after it. Two workmen riding the girder were drowned, and much of the steelwork was so badly twisted and otherwise damaged that it will probably have to be returned to the shop or replaced. The girder that was being hoisted (erection piece B in the sketch) is shown at the left in the photograph, under the wreckage of the derrick.

The bridge, consisting of three 120-ft. girder spans, is sketched in the accompanying drawing. It contains three lines of girders and is about 80 ft. wide. Erection was proceeding from east to west. At the time of the accident the east span was completely erected, although floorbeams and stringers were only pinned and bolted. The derrick rested on the outer end of the center girder, and its back guys are said to have been attached to the erected girders.

News accounts, quoting eye witnesses and others who later examined the wreckage, place the origin of the failure in a broken derrick guy, but this has not been admitted officially. At least one other possible cause has been suggested, namely, that the weight of the girder being hoisted was great enough to pull the south girder of the erected span, to which one of the derrick guys is said to have been attached, off of its supports. In the view below this girder is shown lying across the barges; at the time of the accident it spanned from the abutment in the background to the pier at the right center. Since its bearings were hinge pins between shoe castings, providing no anchorage against uplift, and since the loaded derrick boom at the time of the accident was in almost direct line with the derrick guy attached to this girder, it is contended that conditions were favorable for pulling the girder off its supports.

Regardless of cause, when this girder was jerked forward as the derrick fell, the floorbeams in the south side of the span, being attached to the center girder, twisted this girder as shown and tore it loose from the east floorbeams in the north side of the span. The ends of these latter floorbeams, still attached at the other end to the north girder, came to rest on one of these barges. Some time after the accompanying picture was taken the abutment end of this north girder dropped into the water, perhaps being pulled down by the floorbeams as the barge supporting them settled under a falling tide. Work has been suspended on the steel erection pending several investigations that are under way.

Photo by Rudy Arnold



The bridge was designed by the New York state department of public works and was being erected by the Taylor-Fichter Steel Construction Co., New York City.

Bay Bridge Authority Sued For Engineering Studies

Charles Evan Fowler, former consulting engineer of New York, now resident in New Orleans, on Nov. 9 began action in the federal court at San Francisco to collect engineering fees amounting to $2,500,000 from the California Toll Bridge Authority for work that he claims to have done on the San Francisco-Oakland Bay Bridge. In his suit, Fowler asks for 3 per cent on the $75,000,000 estimated cost of the bridge.

Officials of the bridge authority will make no comment on the suit other than to say that Fowler never was engaged by the authority. Fowler's designs for a cantilever type bridge were published in San Francisco papers in 1914 and his interest in such a bridge was mentioned in subsequent hearings on the project. It is believed that he may have submitted designs to the bridge authority for consideration.

• • •

Highway Consolidation Likely in Virginia

A proposal for the consolidation of the primary and secondary highway systems in the State of Virginia is likely to be acted upon favorably, according to communications from that state. Highway Commissioner Henry G. Shirley has been backing the plan.

At the Holing Through of the Queens Midtown Tunnel

Acme Photo

SANDHOGS and cabinet officers, public officials and financiers, engineers and contractors, all celebrated the holing through of the Queens tunnel in New York Nov. 8. Ole Singstad (upper left) and Jack Macdonald (upper right) chief engineers for the tunnel authority and Walsh Const. Co., respectively, praised each other, the workmen, engineers and public officials upon the completion of the toughest tunnel job ever tackled in New York. Below, Mayor F. H. LaGuardia walks through the holed-out section of one of the two tubes, accompanied by a gang of jubilant sandhogs. He fired the blast that joined the Manhattan and Queens headings in the rocky reef at midriver.

Queens Tunnel Holed Through

Walsh Const. Co. completes driving of difficult tunnel under East River at New York

A blast fired by Mayor LaGuardia of New York at 11 a. m., Nov. 8, broke the final barrier separating the Manhattan and Queens headings of both tubes of the Queens Midtown Tunnel and brought to a successful completion the driving of the most difficult subaqueous tunnel in the New York area, if not in the world. The headings met in full-face hard ground in the submerged rock reef in the middle of the river, and both tubes "met on a dime" for both alignment and grade. Ceremonies in connection with firing of the final blast were held at the top of the Manhattan shafts. Speakers at the occasion included Mayor LaGuardia; Ole Singstad, chief engineer, New York Tunnel Authority; Jack Macdonald, chief engineer, Walsh Construction Co., contractor for the river section; M. E. Gilmore, regional director, PWA; Alfred B. Jones, chairman of the authority, and Brian Feeney, of Local 147, Compressed Air Workers Union. That evening Tom Walsh and some 800 guests celebrated the holing through at a dinner.

Four large shields

The twin tubes, 6,414 ft. and 6,272 ft. long, respectively, were driven by four shields, each 31 ft. 8 in. in diameter, two starting from each shore. Driving for much of the way was under the most difficult of all compressed-air shield tunneling conditions—rock in the bottom and silt in the top of the heading. Each shield started in full-face rock, entered part rock and part silt ground, then went into full-face silt; the order was reversed as the shields approached the rocky reef at midriver. The Manhattan headings were especially hazardous, for the shields encountered boulders and riprap embedded in the silt, which made a porous face with resultant trouble in holding the air. In June, 1938, a fire in the north Manhattan heading caused the face to collapse (*ENR*, June 30, 1938, p. 889) and the heading was flooded for weeks. Twice the south Manhattan heading was almost lost when extremely leaky ground was encountered, but both times the contractor averted disaster after a hard fight. For weeks it was necessary to keep the faces of both Manhattan headings plastered with clay to hold air, which, at times, was a high as 38 lb. pressure.

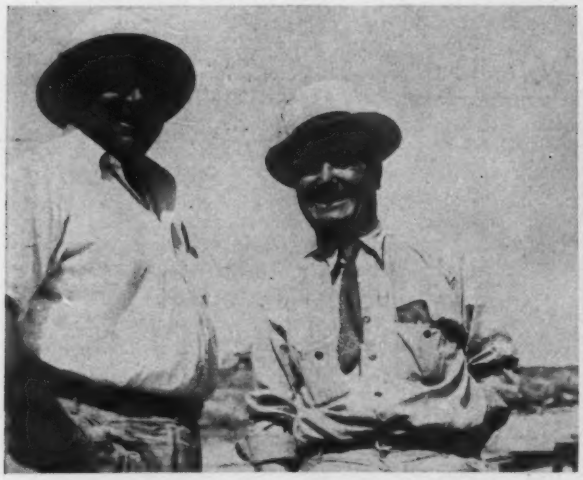
The tunnel is being built by the

(*Continued on p. 11*)

John J. Grandfield (left) and **John Carlin,** of Grandfield, Farrar & Carlin, have been making history with 25- and 30-cu. yd. carrying scrapers in their grading contracts on the railroad relocation around Shasta reservoir. On shorter hauls one man (on a tractor pulling a 25-cu. yd. carrying scraper) excavates, transports and compacts at the rate of 200 cu. yd. per hour. Their contracts, consisting of seven schedules, total $1,652,000. Their fills, some of which are 100 ft. high, are settling only about 1 per cent by reason of accurate moisture control and thorough compaction.

Old-timers in Chicago public works, **James J. Versluis** (left) and **Loran D. Gayton** have been working for the city for 30 and 26 years, respectively. Versluis is engineer of waterworks construction, and Gayton is city engineer. Until recently all construction in the waterworks field has been done on a force account basis with Versluis in direct charge under Gayton's general supervision. The city now has under way its 320 mgd $20,000,000 filtration system, with about $8,000,000 under contract and some $12,000,000 in tunnels under force account.

MEN AT WORK



In another page of this issue is a picture story of progress on the Yakima project at Yakima, Wash. These two men are partly responsible for that progress. **Wm. Connolly** (left) is local manager for T. E. Connolly, Inc., contractors on Tunnel 5 of the Roza Division. **R. F. Skinner** was until recently U.S.B.R. associate engineer in charge of concrete construction for the project. He has now been promoted to the rank of engineer on the Central Valley Project.

General Electric's new million-and-a-half-dollar Chicago headquarters soon will rise where these company officials performed preliminary spadework recently. **B. E. Sunny** (left) and **J. B. Wilson** (right) are members of the board of directors, and **W. O. Batchelder** (center) is vice-president in charge of the Midwest district. The 7-story building will occupy a plot 210x259 ft. It will bring together agencies now housed in nine different buildings.

MEN AND JOBS

H. V. STEPHENSON, civil engineer with the Veterans Administration Facility at Excelsior Springs, Mo., has been transferred to the Pittsburgh, Pa., office to take over the duties of utility officer. Soon after graduating from the University of Illinois in 1914 with a degree in civil engineering, Stephenson joined the commission of parks and buildings at Chicago to work until 1931. He then was employed by the Veterans Administration, Washington, D. C., as associate engineer. In 1933 he joined the U. S. Engineers to work in the Rock Island district on the 9 ft. canalization of the upper Mississippi River, leaving there in August, 1936, to go to Excelsior Springs, Mo.

JOHN KELLER, assistant engineer with the Toledo, Ohio, waterworks, has been promoted to division engineer and will be employed on the city's new Lake Erie water supply project. Other engineers appointed to work on that project are: WILLIAM H. RIPPEY, engineer; PAUL R. MCNUTT, junior engineer; THOMAS B. HENRY, junior engineer, and LAWRENCE W. PENGEOT, NORMAN R. DRULARD and W. DAVID BRANDT, senior engineering aides.

GARRETT KEMP, engineering and geology consultant, has been appointed consultant to the school of engineering, Texas A. & M. College. Kemp has been a member of the faculty at Purdue University, the University of Illinois, the University of Arkansas, the University of Kentucky and Oklahoma A. & M. College.

FREDERICK SKENE, dean of the school of technology at City College of New York, will retire at the end of the current semester. Skene has been head of the school of technology for the past 18 years. He worked for a time as state engineer for the State of New York.

PAUL A. JONES, construction engineer on the first division of the Buffalo Rapids reclamation development in Montana, will be in charge of construction work on the second division. The second project covers 9,800 acres near the towns of Shirley, Terry and Fallon and water will be obtained from the Yellowstone River.

EVERETT K. SHARLOW has been named port engineer for the city of Miami, Fla. Sharlow was field engineer during the construction of the Hialeah water plant at Miami and was field engineer in charge of construction of the Fifth St. Bridge and the Fourth Ave. Bridge. He joined the Miami engineering forces in August, 1924, as harbor and dock engineer.

CHARLES L. HILL, former city engineer of Reno, Nevada, has been named secretary treasurer of the Associated General Contractors of America.

LIEUT. COL. C. S. L. HERTZBERG, consulting engineer of Toronto, Ont., has been appointed commanding officer with the First Divisional Engineers of the Canadian Active Service Force. Colonel Hertzberg, a partner in the firm of Harkness and Hertzberg, specialists in structural engineering, is a graduate of the University of Toronto. He served with the Royal Canadian Engineers throughout the World War.

JOHN A. NORRIS has been reappointed as chief engineer and general manager of the Brazos River Conservation and Reclamation District. LEWIS MIMS, Houston, Tex., is president of the organization.

PARK S. BOOKWALTER, Dayton, O., for many years engineer of Montgomery County, O., has been named assistant division engineer of Division No. 8 with the Ohio Department of Public Works. His headquarters will be at Middletown and he is to succeed ROBERT FISHER, who has been planning engineer for Divisions 8 and 9.

HARRY E. NEAL, traffic engineer for 19 years with the Ohio Department of Public Works, is now chief of the newly created bureau of traffic and safety in the works department. The new bureau will cooperate with the bureaus of right of way, construction and maintenance and the state highway patrol relative to traffic safety. The new bureau will be under the supervision of HAL G. SOURS, assistant state highway director and chief engineer.

WILFRED E. BROWN, West Hartford, Conn., has been named director of the Connecticut state highway safety commission. Brown, formerly research engineer with the National Conservation Bureau, was at one time employed by the Connecticut Department of Motor Vehicles. He succeeds Herbert L. Crapo, who has resigned.

ARTHUR B. MORRILL, assistant civil engineer of sanitary design with the department of public works of Detroit, has been appointed plant manager of Detroit's new $22,000,000 sewage disposal plant at Jefferson Ave. and the Rouge River. Morrill is a graduate of Massachusetts Institute of Technology. For several years he taught at the National University at Tientsin, China. LEO V. GARRITY, former construction and inspection superintendent at the new plant, will be Morrill's assistant.

C. J. MACKENZIE, dean of the college of engineering at the University of Saskatchewan, Can., has been named acting president of the National Research Council. Dean MacKenzie is an engineering graduate of Dalhousie University.

WILLARD S. MATTSON has been named county surveyor for Wright County, Minn.

C. C. WEINTZ, resident engineer for the PWA in Des Moines, Iowa, has begun new duties as construction superintendent for the Iowa board of control.

KENNETH FRANKLIN, borough director of maintenance and construction for the New York City park department, has been placed in charge of inspection of all park construction.

JOE DE AROZENA, district engineer in the Arizona State Highway Department, has been named engineer of contract construction.

IRVIN L. CLYMER, graduate of Purdue University and since 1938 vice-president of the Michigan Limestone & Chemical Co., has been named president of his firm. Clymer joined Michigan Limestone in 1926 as chief engineer and prior to that had worked with the Robins Conveying Belt Co. as draftsman and engineer. He succeeds JOHN G. MUNSON, who was recently elected vice-president, raw materials, with United States Steel Corp. of Delaware. JOSEPH PENGLASE succeeds Clymer.

DONALD S. BURNS, army engineer in charge of the Johnstown channel improvement project, Pittsburgh office of U. S. Engineers, was recently transferred to Fort DuPont, N. J., for active service. A. L. HERTZ is project engineer in charge of the $7,500,000 flood control program and LIEUT. COL. W. E. R. COVELL is district engineer at the Pittsburgh office.

K. E. MENEKE, engineer of Filtration Engineers, Inc., Newark, N. J., has resigned to join the staff of the Lancaster Research Laboratories, division of Lancaster Iron Works, Inc., Hackensack, N. J. Meneke graduated from the U. S. Naval Academy at Annapolis in 1933 and joined the Filtration Engineers in 1937.

MEETINGS

HIGHWAY RESEARCH BOARD, annual meeting, National Academy of Sciences, Washington, D. C., Dec. 5–8.

MEXICO DEPARTMENT OF PUBLIC HEALTH, first national convention of sanitation engineers, Mexico City, Dec. 18-20.

REGIONAL AND LOCAL

NEW ENGLAND WATER WORKS ASSOCIATION, November meeting, Hotel Statler, Boston, Nov. 16.

AMERICAN SOCIETY OF CIVIL ENGINEERS, Arizona section, annual fall meeting, Phoenix, Ariz., November 25.

NEBRASKA IRRIGATION ASSOCIATION, annual convention, North Platte, Nebr., Dec. 7–8.

EASTERN PHOTOELASTICITY CONFERENCE, Massachusetts Institute of Technology, Cambridge, Mass., Dec. 9.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, Carolinas branch, annual convention, Columbia, S. C., Dec. 14-15.

ELECTION AND ACTIVITIES

THE NORTH CAROLINA section of the American Water Works Association, meeting at Charlotte November 6-8 elected George W. Moore, Albemarle, as chairman to succeed William M. Piatt, Durham, consulting engineer. Meeting jointly with the North Carolina Sewage Works Association, the section elected R. W. Luther, Elizabeth City, vice-chairman to succeed D. S. Asbell, Raleigh, and re-elected R. S. Phillips, Durham, secretary and treasurer. Herman G. Baity, University of North Carolina, was announced as the winner of the George W. Fuller memorial award. Walter M. Franklin, superintendent of the city filtration plant at Charlotte, was awarded the Maffitt membership cup. Principal speakers and honor guests at the convention were: J. Arthur Jensen, Minneapolis, Minn., national president of the American Water Works Association; Harry E. Jordan, New York, national secretary; and William W. Brush, New York, national treasurer and editor of "Water Works Engineering." Other speakers included: W. M. Wallace, Durham consulting engineer; Linn H. Enslow, editor of "Water Works and Sewerage"; A. E. Griffin, chief chemist, Wallace and Tiernan Co., Newark, N. J.; L. L. Hedgepath, Pennsylvania Salt Manufacturing Co., Philadelphia; R. S. Phillips, chief chemist for the city of Durham; G. S. Rawlings, Charlotte construction engineer; J. L. Greenlee, assistant superintendent of the Charlotte water department; Ray Galloway, of Charlotte.

THOMAS H. WILCOX, road engineer of Ontonagon County, Mich., has been elected president of the Upper Peninsula Road Builders Association at Michigan. E. J. Pearce, road engineer of Menominee County, is vice-president, and George W. Koronski, engineer of Gogebic County, is secretary-treasurer.

THE NORTH CAROLINA chapter of the American Society of Heating and Ventilating Engineers was addressed by F. E. Giesecke, Texas A. & M. College, at its quarterly meeting at Charlotte Nov. 3. First vice-president of the national society and director of the Engineering Experiment Station at Texas A. & M., Giesecke spoke on "Radiant Heating and Cooling for Buildings." R. B. Rice, North Carolina State College, as president of the group, presided. Other speakers included: J. G. Marshall, city manager of Charlotte; L. L. Vaughan, head of the mechanical engineering department at North Carolina State College; Walter Leroy, president of the Charlotte Mechanical Engineers Club, and Maurice G. Townsend, president of the Charlotte Engineers Club. About 75 engineers took part.

CHARLES GILMAN HYDE, University of California, has been nominated local director of the American Society of Civil Engineers for the San Francisco section. Professor Hyde, a graduate of Massachusetts Institute of Technology, has been connected with the Central California water supply project.

THE EIGHTH ANNUAL Georgia water and sewage school recently brought 273 men to the Georgia Tech campus. Illustrated lectures, laboratory demonstrations, plant inspections and discussions played an important part in the school. New officers of the Georgia Water and Sewage Association are: Clark W. Jones, superintendent of water and light, Dalton, president; J. C. Boesch, Jr., assistant engineer with Martha Mills, Silvertown, first vice-president; George H. Sparks, superintendent of water and light at East Point, second vice-president; Paul Weir, superintendent of filtration at Atlanta, secretary-treasurer. Members of the certification committee re-elected are: Carl Alexander, superintendent of filtration at Rome; O. W. Gray, chemist, with the Thomasville water and light department, and H. A. Wyckoff, professor of biology, and John L. Daniel, professor of chemistry, Georgia School of Technology. Lewis Simonton, superintendent of water purification and sewage treatment at Griffin, and G. R. Frith, assistant engineer with the Georgia department of public health, were re-elected to the board of control of the Federation of Sewage Works Associations.

AT A RECENT MEETING of the Wisconsin Section of the American Water Works Association in Oshkosh, the program was built around the desire to present information of particular value to the superintendent in his ordinary operating duties. The outstanding paper along this line was that given by John R. Bayliss, physical chemist, Chicago water department; his paper being entitled "Filter Operation and Maintenance." James Brower of the Milwaukee Sewerage Commission presented a paper on the maintenance of pumps, motors and controls. Hazards of waterworks plants were covered in a paper prepared by A. H. Soldner, Industrial Commission of Wisconsin. Other speakers included: Frank Josslyn, vice-president of the board of water commissioners of Oshkosh; J. P. Schwada, city engineer of Milwaukee; John H. Barth, city engineer of LaCrosse, Wis.; William D. Darby, Lake; A. E. McMahon, Preble; Thomas E. Wolfe, research engineer, Cast Iron Research Association; H. P. Binder, Allis Chalmers Mfg. Co., Milwaukee; R. G. Ball, who discussed cathodic protection of elevated steel water tanks as carried out by W. D. Loreaux of Dundee, Mich.; F. T. Redman, who presented a paper prepared by Owen Rice of Calgon, Inc.; H. M. Olson, Ohio Salt Co., and J. Arthur Jensen, president, American Water Works Association. Officers elected for the coming year are: Albert E. Hintz, Oshkosh, chairman; James W. Myers, Jr., Kenosha, vice-chairman; W. C. Staeffler, Manitowoc, director; Jerome Zufelt, Sheboygan, director, and L. A. Smith, superintendent of water department, Madison, Secretary-treasurer. H. H. Brown, Milwaukee water department, was elected director on the national board to succeed Walter A. Peirce, whose term expired. Total attendance was 256, a record for the Wisconsin section.

License Examinations

IOWA: Examinations for professional engineer, Dec. 5-6; for land surveyors, Dec. 9, at the State House, Des Moines.

Conferences

EASTERN AIR CONDITIONING CONFERENCE, Lehigh University, Bethlehem, Pa., Nov. 10-11.

Queens Tunnel

(*Continued from p. 7*)

New York City Tunnel Authority at a cost of $58,000,000, financed by PWA and RFC, as a major traffic connection between Manhattan and Queens. Approach construction is well along, and the tunnel will be completed in about a year. The Walsh Construction Co. of Davenport, Ia., has the contract for the river section, amounting to about $22,000,000. Jack Macdonald, as chief engineer for the contractor, is in charge of construction; Harry Redwood is tunnel superintendent. Walsh will place the concrete lining inside of the cast iron lining, and will build the roadway and ceiling slabs.

Ole Singstad is chief engineer of the Tunnel Authority, and Jacob Mechanic is construction engineer. J. J. Nanry is resident engineer on the Manhattan side; D. W. Coe on the Queens side.

CONTRACTS AND CAPITAL

ENGINEERING construction awards for the week, $96,416,000, are the second highest of the year, and 64 per cent higher than in the corresponding week last year.

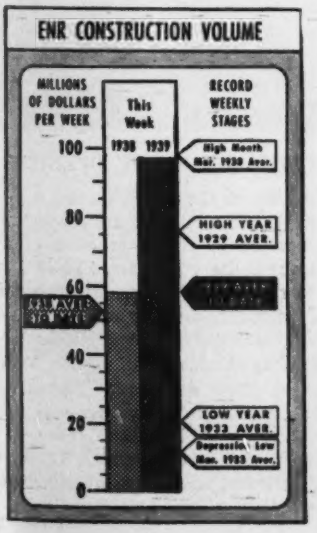
The current week's awards bring 1939 construction to $2,710,373,000, a 13 per cent increase over the total for the initial 46-week period in 1938.

Both private and public awards for the week reached their third highest volumes of the year. Private awards are 182 per cent above the corresponding week last year. This is the tenth consecutive week that they have topped their respective 1938 values. Public construction is 39 per cent higher than in the week last year due to the high volume of public buildings.

Nine large public building projects, totalling almost $30,000,000, bring this class of construction to the second highest week of the year. Commercial building and large-scale private housing is at its third highest volume of 1939 as a result of nine awards in six states totalling $10,000,000. In addition to these two classes of work, waterworks, bridges, industrial buildings, streets and roads and unclassified top their 1938 values; and sewerage, bridges, earthwork and drainage, streets and roads, and unclassified are above the short preceding week.

New capital for construction purposes for the week totals $7,282,000, a decrease of 67 per cent from the volume for the corresponding week last year. The current week's new financing is made up of $4,374,000 in state and municipal bonds, and $2,908,000 in corporate security issues.

New construction financing for the year to date, $2,270,549,000, is 35 per cent below the volume for the 46-week period last year.



CONTRACTS

(Thousands of dollars)

	Week Ending Nov. 17 1938	Nov. 9 1939	Nov. 16 1939
Federal	$11,075	$5,725	$11,149
State & Municipal	37,510	27,402	56,478
Total public	$48,585	$33,127	$67,627
Total private	10,195	20,476	28,789
TOTALS	$58,780	$53,603	$96,416
Cumulative 1939	(46 weeks)		$2,710,373
1938	(46 weeks)		$2,402,711

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1938 46 Wk.	1939 46 Wk.
NON-FEDERAL	$2,369,607	$1,142,521
Corp. securities	350,932	196,418
State & Mun.	559,097	457,157
R.E.A. loans	67,495	89,445
R.F.C. loans	100,344	7,854
P.W.A. allot.	825,185	.....
U.S.H.A. loans	265,054	201,647
Fed. Aid—Hwys.	201,500	190,000
FEDERAL	$1,143,695	$1,128,028
TOTAL CAPITAL	$3,513,302	$2,270,549

FHA MORTGAGES

	Week Ending Nov. 12 1938	Nov. 4 1939	Nov. 11 1939
Selected for appraisal	$16,374	$20,392	$19,000*
Cumulative 1939	(45 weeks)		$1,005,302*
1938	(46 weeks)		$ 889,486

* Subject to revision.

ENR INDEX NUMBERS

Index Base		1913	1926
Construction Cost	Nov.	238.20	114.50
Building Cost	Nov.	201.24	108.95
Volume	Oct.	222	97.

Washington Housing Trouble Continues

No agreement reached by local body and USHA as to proper design standards

An attempt to settle long-standing disagreements on housing design standards between the Alley Dwelling Authority, Washington's local housing body, and the U. S. Housing Authority fell flat last week when USHA turned down an ADA proposal for a two-way project designed to compare the ideas of the two agencies.

ADA has long contended that the USHA, in its efforts to keep costs well below the legal limit, insists on too small rooms, too many dwelling units per acre, and too many small economies such as leaving doors off closets; it believes that USHA approves too many multi-story projects. In general, USHA technicians have estimated the costs of ADA plans much higher than did the local housing authority.

Last week ADA submitted an application for a project to be divided into two parts—one section designed according to ADA ideas, and the other according to what ADA conceived to be USHA standards. Comparative costs and maintenance expense could thus be determined, ADA contended.

In turning down the application, USHA Administrator Straus said that he could not loan money to a local authority for a project of which the local body itself did not approve and that in any case he did not like the "USHA" section of the proposed project. Straus gave no indication of what he thought of the "ADA" part, but he said that if it conformed to the requirements of the housing act he would approve it and that if it did not he could not legally do so.

• • •

Union Paving Co. to Build Pit River Bridge Piers

The Union Paving Co., San Francisco, has been awarded a contract on its bid of $1,138,000 to construct the concrete piers and abutments of the Pit River Bridge, a part of the Central Valley project work. The bridge will carry the relocated main line of the Southern Pacific R.R. and four lanes of U.S. Highway 99 across an arm of the Shasta reservoir 14 miles north of Redding, Cal.

The bridge, which is a double deck combination cantilever and truss structure two-thirds of a mile in length, will be built with the lower floor almost 500 ft. above the present level of Pit River. The tallest pier will be 358 ft. high and 95x90 ft. at the base.

OBITUARY

DAVID A. CHALLIS, 62, pioneer highway contractor of the upper Ohio Valley and president of D. W. Challis & Sons, Inc., Sewickley, Pa., died recently. Challis was one of the founders of the Constructors Association of Western Pennsylvania. He was also a member of the association's labor committee that negotiated the unusual labor agreement for heavy construction work in Western Pennsylvania, as announced last April.

ROSS E. ALLISON, 55, an engineer formerly employed by the Arizona State Highway Department, died Nov. 2 at Phoenix, Ariz. Allison worked with the department ten years, acting as chief location engineer for a time. He had also once worked with the U. S. Bureau of Public Roads, now the PRA.

L. T. JESSUP, 50, drainage engineer with the U. S. Department of Agriculture, died recently near Yakima, Wash. Soon after graduating from the University of Idaho in 1913, Jessup was employed as a drainage engineer by the federal government. Just recently he was transferred to the engineering department of the Soil Conservation Service.

C. ARTHUR BROWN, 73, water treatment plant specialist, died Nov. 4 in Lorain, Ohio. Early in life Brown worked with the water department at Quincy, Ill. While employed by the O. H. Jewell Filter Co., in 1896 he designed and supervised the construction of the Lorain municipal water works plant. In 1905 he was employed by the American Steel & Wire Co. as engineer in charge of water supply for the company's plants.

Other recent deaths include: WILLIAM H. ABBOTT, 90, retired contractor of St. Louis; HECTOR H. GIROUARD, 54, construction supervisor for the Ontario department of highways, Little Current, Ontario; ALEXANDER SAUL, 78, general contractor of Winnipeg, Manitoba; JAMES F. CRANK, 69, retired contractor of Ashland, Ky.; JOHN RENZ, 62, building contractor of Dunkerton, Ia.; WILLIAM W. K. SPARROW, 59, formerly valuation engineer of the Chicago, Burlington & Quincy R. R., Evanston, Ill.; JOHN A. GRANQUIST, 82, general contractor, Stillwater, Minn.; ROBERT L. GILILLAND, 74, building contractor, Tempe, Ariz.; GUY MCDOWELL, 54, building contractor, Des Moines, Ia.; ROBERT L. STEARNS, 67, builder, Tucson, Ariz.; and FRANK WALDRON, 83, builder, Phenix, Ariz.

New York Names Dam For Thaddeus Merriman

Lackawack Dam, one of the major elements of the new aqueduct system that New York City is building to add to its water supply, is to be called Merriman Dam in honor of the late Thaddeus Merriman, former chief engineer of the Board of Water Supply of the city. In taking the action the board, in its resolution, stated that Mr. Merriman "through his genius and efforts made a signal contribution to the extension of the water supply of the city of New York."

Amplifying the board's statement, Walter E. Spear, the present chief engineer, said: "To Mr. Merriman the city is indebted for the conception of an additional water supply from Rondout Creek and the tributaries of the Delaware, including the Neversink River and the East branch of the Delaware. He gave much of his talents to the negotiations with New Jersey and Pennsylvania in 1925 and 1927 looking to some allotment of the waters of the Delaware between the three states and laid out the project on which we are now working for a supply from the Delaware."

WASHINGTON HIGHLIGHTS

Special reports by Paul Wooton

NO DECISION has yet been reached by the Bureau of Reclamation as to whether to award a contract for the Continental Divide Tunnel of the Colorado-Big Thompson project. Bids were opened for the second time last September, and only one bid—the $10,350,000 offer of the Keystone Construction Co.—fully met the specifications. The bids are still being studied.

THE U. S. SUPREME COURT this week agreed to permit the states of Iowa and Missouri to settle out of court a boundary dispute arising from shifts in the course of the Des Moines River. Last year Missouri asked the court to determine whether the river, the original boundary between the states, is still the boundary even though it has moved. Recently the attorneys for the two states agreed that the boundary ought to be the center of the river, no matter where the river moves.

CHICAGO'S SOUTHWEST SEWAGE TREATMENT PLANT OPENED

THE 400 mgd Southwest Sewage Treatment Plant at Stickney was officially opened Nov. 6 by the Sanitary District of Chicago. The plant, which cost $14,000,000, is the largest activated sludge plant in the world. Total investment in Chicago for special treatment of sewage now totals $163,000,000 in addition to the $125,000,000 previously invested in a dilution system. An area of 442 sq.miles and a population of 6,700,000 including an industrial equivalent of 2,000,000, is served.

Opening of the new unit was a part of the celebration commemorating the semi-centennial of the creation of the Chicago Sanitary District. Shown from left to right are: William H. Trinkaus, chief engineer, sanitary district; U. F. Turpin, sanitary engineer, PWA; Walter H. Fagett, (smoking cigar), acting assistant chief engineer; Thomas F. Byrne, (pushing button) trustee, sanitary district; Loran D. Gayton, city engineer, city of Chicago; J. L. Friedman, trustee, sanitary district, and George Seif, trustee, sanitary district.

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

FRIANT DAM, CALIFORNIA

OWNER: Bureau of Reclamation, Friant Division, Central Valley Project, California. R. F. Walter, Denver, Colo., chief engineer.

PROJECT: Constructing Friant Dam, near Friant, Calif., on San Joaquin River; concrete gravity type dam approximately 3,430 ft. long at crest and about 300 ft. high. Concrete cut-off wall in trench extends from left end of dam into abutment. Foundation rock to be drilled and grouted and drainage provided by drilled holes discharging through 6-in. pipes into grouting and drainage galleries. Concrete in dam divided into blocks or columns by means of vertical contraction joints. Grout pipes embedded in mass concrete, with outlets into contraction joints. Joints to be pressure grouted after concrete has cooled. Concrete to be cooled artificially by system of pipes. Spillway consists of ogee section in river channel. Flow of water over spillway controlled by drum gates. Two river outlets, and outlets for Friant-Kern and Madera Canals provided for. Wooden forms for exterior surfaces of dam which will be exposed permanently to be constructed of matched lumber lined with absorptive lining approximately ½-in. thick. This eliminates required rubbing of mortar into surface pitting.

CONDITIONS: Government to furnish cement; pumicite; absorptive form lining and nails; reinforcing bars; anchor bars, rods and bolts; metal inserts; cinch anchors; metal tubing; metal pipe, fittings and valves; handrail pipe and fittings; grouting units; drum gates and operating mechanisms; conduit castings; needle valves and discharge guides; bulkhead and coaster gates, frames and tracks; outlet pipes and supports; pipe for drains; gantry crane and track; trashrack metalwork; metal stairways and ladders; hatchways, manholes, floor plates, gratings and catch basin inlets; sealing materials; miscellaneous metalwork; electrical equipment; meters; paint and coating materials; and lubricants for permanent machinery. Work to be completed in 1,200 calendar days. Highway and railroad transportation facilities available. Wage rates on the project are: skilled labor, $1.00 to $1.50 per hr.; semi-skilled, 75c. to $1.12½; and common labor, 68¾c. to 90c. per hr.

BIDS: Five bids were opened September 14, 1939, ranging from the contract low of $8,715,358 to $12,483,173.

LOW BIDDERS:

1. Griffith Co., Los Angeles, Calif. and Bent Bros., Inc., Los Angeles, Calif., (contract) joint bid $8,715,358
2. Shasta Constr. Co., San Francisco, Calif... 9,105,760
3. West Coast Construction Co., Inc., Los Angeles, Calif. 9,197,169

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Diversion and care of river	L.S.	$115,000.00	$100,000.00	$20,000 00
2. Excav., strip, sand and grav. deposits	600,000 c. y.	.45	.08	.10
3. Excav., common, for dam, etc.	190,000 c. y.	3.00	2.50	3.50
4. Rock excav., dam, etc	580,000 c. y.	3.00	2.50	3.50
5. Rock excav., cutoff wall ftg.	200 c. y.	7.50	6.00	8.00
6. Drill line holes	32,000 l. f.	.25	.40	.40
7. Backfill	110,000 c. y.	.30	.45	.25
8. Compacting backfill	7,000 c. y.	.70	.70	1.50
9. Drill grout holes, to 25-ft.	14,000 l. f.	.50	1.30	.50
10. Drill grout holes, 25–50-ft.	13,500 l. f.	1.00	1.30	1.80
11. Drill grout holes, 50–100-ft.	23,000 l. f.	1.00	1.30	2.20
12. Drill grout holes, 100–200-ft.	1,600 l. f.	1.00	1.30	2.50
13. Pressure grouting	75,000 c. f.	1.00	1.50	.60
14. Drill drain. holes, to 25-ft.	1,300 l. f.	6.00	3.00	4.00
15. Drill drain. holes, 25–50-ft.	6,500 l. f.	6.00	3.00	4.50
16. Drill drain. holes, 25–75-ft.	13,000 l. f.	6.00	3.00	4.50
17. Drill holes for setting pipes	400 ea.	2.25	6.00	4.00
18. Drill holes, anchor and grout bar	3,700 l. f.	.70	1.75	1.50
19. Drill holes, uplift pipes	150 l. f.	2.25	2.00	1.50
20. Porous conc. drain tile	55,000 l. f.	1.00	1.00	.45
21. 12-in. split sewer pipe drains	3,000 l. f.	.25	.70	.70
22. 24-in. split sewer pipe drains	3,200 l. f.	.50	1.40	1.50
23. 36-in. split sewer pipe drains	400 l. f.	1.00	2.40	3.00
24. 6-in. drains, unecment. joints	900 l. f.	.50	.40	.70
25. 12-in. drains, unecment. joints	950 l. f.	1.00	.70	1.00
26. 18-in. drains, cemented joints	400 l. f.	1.00	1.50	1.25
27. 24-in. drains, cemented joints	220 l. f.	1.50	2.00	1.50
28. Grouted-paving gutters	280 s. y.	3.00	5.00	6.03
29. Concrete; in dam	1,850,000 c. y.	2.48	2.86	2.60
30. Concrete; parapets	780 c. y.	44.00	40.00	24.03
31. Conc.; spillway crest, piers	9,300 c. y.	8.00	11.00	7.50
32. Conc.; floor spillway apron	22,000 c. y.	2.30	4.00	5.30
33. Conc.; grav. training walls	11,000 c. y.	3.75	6.50	7.00
34. Conc.; cantilever train. walls	2,400 c. y.	10.00	13.00	8.00
35. Conc.; trashrack structures	1,950 c. y.	40.00	37.00	20.00
36. Concrete; blockouts	500 c. y.	30.00	70.00	40.00
37. Conc.; needle valve structure	2,280 c. y.	9.00	17.00	10.00
38. Conc.; floors of stilling basin	3,100 c. y.	2.80	6.00	8.00
39. Conc.; walls, outlet wks., still. basin	2,100 c. y.	17.00	25.00	22.00
40. Conc.; cutoff wall footing	150 c. y.	2.20	6.00	10.00
41. Conc.; cutoff wall	230 c. y.	16.00	16.00	15.00
42. Concrete; backfill	1,050 c. y.	6.50	12.50	12.00
43. Place reinforcing bars	3,300,000 lb.	.016	.02	.02
44. Welding reinf. bars	200 ea.	1.00	1.00	1.00
45. Cooling concrete, dam	1,850 c. y.	.06	.11	.12
46. Finish lighting recesses	320 ea.	5.00	3.25	6.00
47. Chip and roughen conc. surf.	500 s. y.	2.50	3.00	2.50
48. Place metal sealing strips	56,500 l. f.	.60	.70	.60
49. Place rubber water stops	2,100 l. f.	1.00	1.00	.60
50. Place elastic joint filler	1,800 s. f.	.30	.20	.60
51. Inst. tubing and ftgs., joints	195,000 lb.	.16	.15	.17
52. Inst. metal tubing and ftgs	2,450,000 lb.	.12	.09	.11
53. Inst. conduit-lining cstgs	584,000 lb	.01	.03	.02
54. Install outlet pipes	608,000 lb.	.0125	.025	.02
55. Inst. gate frames and tracks	290,000 lb.	.035	.04	.04
56. Inst. bulkhd. and coaster gates	107,000 lb.	.01	.025	.02
57. Inst. trashrack metalwork	646,700 lb.	.0125	.01	.015
58. Install tube valves	1,551,000 lb.	.0125	.02	.02
59. Install drum gates	1,834,000 lb.	.025	.03	.02
60. Inst. drum gate contr. mech.	102,000 lb.	.06	.05	.05
61. Inst. met. tubing; brass, steel, wrt. iron and c. i. pipe, ftgs., valves under 6-in. dia	155,000 lb.	.06	.10	.08
62. Same as above, over 6-in. dia.	640,500 lb.	.025	.05	.05
63. Install gantry cranes	313,000 lb.	.0125	.025	.01
64. Install track rails	128,700 lb.	.0125	.03	.02
65. Install metal stairways	173,200 lb.	.025	.04	.03
66. Install pipe handrails	14,600 lb.	.10	.07	.08
67. Inst. manholes, pla., gradings, etc	24,000 lb.	.0125	.05	.04
68. Install hatchway covers	37,900 lb.	.01	.04	.04
69. Install misc. metalwork	30,000 lb.	.12	.15	.08
70. Inst. elec. metal conduit, 1¼-in. or less	9,400 l. f.	.18	.40	.20
71. Inst. elec. metal cond. 1¼-3-in.	7,700 l. f.	.35	.50	.25
72. Install ground wires	170 lb.	1.00	.30	1.00
73. Install electrical conductors	12,500 lb.	.15	.25	.20
74. Install electrical equipment	6,500 lb.	.12	.10	.20
75. Install electrical cable	20,000 l. f.	.10	.15	.10

GRADE ELIMINATION, LOUISVILLE, KY.

OWNER: City of Louisville, Ky., and Pennsylvania Railroad. James B. Wilson, Chief Engineer, City of Louisville.

PROJECT: Elevating railroad tracks on 14th Street from Ohio River south to Maple Street, thence east to 10th Street Union Station overpass, including 11 underpasses with clear spans over major east and west streets separating business district from west end residential district.

CONDITIONS: City to pay 35 per cent of cost, railroad 65 per cent. Contractor to furnish all materials, and finish job by December 31, 1940. Rail and highway transportation facilities available. Wage rates: skilled $1.10 per hr.; semi-skilled, 60 to 90c. per hr.; and common, 45c. per hr. BIDS: Five bids were received Sept. 18, 1939, ranging from the contract low of $1,206,592 to $1,382,593.

LOW BIDDERS:

1. Henry Bickel Co., Louisville, Ky. (contract) $1,206,592
2. Ruby Lumber Co., Madisonville, Ky..... 1,224,996
3. John F. Casey Co., Pittsburgh, Pa..... 1,327,676

(Contract Unit Prices continued on page 14.)

(Contract Unit Prices continued from page 13.)

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Unclassified excavation	55,077 c. y.	$0.90	$1.20	$1.37
2. Earth borrow, embankment	142,500 c. y.	.88	.75	1.05
3. 6-in. pl. conc. base crse	47,025 s. y.	1.50	1.50	1.50
4. 7-in. reinf. conc. driveways, Cl. A	15,500 s. y.	2.55	2.25	2.60
5. 6-in. pl. conc. cement alleys	3,380 s. f.	2.00	1.85	2.10
6. 1½-in. sh. asph. binder, 1½-in. surf. crse	46,831 s. y.	1.35	1.35	1.35
7. Comb. curb and gutter, type C.	19,906 l. f.	1.10	1.00	1.15
8. Reset old curbs	100 l. f.	.50	.75	.50
9. 12-in. catch bas. leads, vitr. pipe	2,400 l. f.	5.00	2.40	5.30
10. 12-in. catch bas. leads—c.i.	54 l. f.	8.00	6.10	8.40
11. 12-in. dia. sewer, vitr. pipe	1,911 l. f.	3.00	2.45	4.20
12. 15-in. dia. sewer, vitr. pipe	1,120 l. f.	3.50	2.85	4.70
13. 18-in. dia. sewer, vitr. pipe	935 l. f.	4.00	3.50	5.25
14. 18-in. dia. sewer, cast iron	180 l. f.	10.00	8.00	10.00
15. C.B. vert. curb type circ., sgl. fr	104 ea.	75.00	60.00	80.00
16. C.B. vert. curb type circ', dbl. fr	24 ea.	85.00	94.00	100.00
17. Manhole with steps, fr. and cov	239 ver. f.	13.50	9.75	10.00
18. Same, reconstruct	15 ea.	60.00	75.00	50.00
19. Reset M.H. or C.B. frames, old fr. and cov	21 ea.	5.00	6.00	5.00
20. Reset M.H. or C.B. fr., new fr. and cov	21 ea.	20.00	25.00	20.00
21. Concrete header	115 l. f.	.35	.75	.40
22. Fire hydrant, connections	11 ea.	300.00	295.00	300.00
23. Binder in place	565 tons	8.00	6.50	8.00
24. Sheet asphalt, in place	565 ton	10.00	8.25	10.00
25. Grouted ballast, in place	580 c. y.	10.00	12.50	8.00
26. 4½-in. sidewalk, Cl. B conc	23,567 s. y.	1.60	1.50	1.65
27. 6-in. priv. driveways, Cl. B conc	2,441 s. y.	2.00	1.85	2.10
28. Priv stairways, Cl. B conc	300 c. y.	20.00	16.00	23.00
29. Cl. A concrete underpinning	80 c. y.	23.88	16.00	20.00
30. Cl. A re. conc. st. retain. wall	900 c. y.	15.40	12.00	20.00
31. Inlet, freight yd. driveways	44 ea.	25.00	27.00	42.00
32. 21-in. sewer, vitr. pipe	415 l. f.	4.58	6.85	5.00
33. Track work	L.S.	175,000.00	175,000.00	175,000.00
34. Cl. A conc., superstructure	3,250 c. y.	16.00	17.00	14.00
35. Class B concrete	7,115 c. y.	12.00	14.00	14.00
36. Reinforcing steel	541,940 lb.	.04	.04	.054
37. Struct. steel, incl. painting	3,109,660 lb.	.0357	.06	.052
38. Membrane waterproofing	27,870 s. f.	.40	.47	.35
39. Damp-proofing	90,000 s. f.	.05	.06	.04
40. Pipe handrail, retain. wall	2,265 l. f.	1.75	1.80	1.60
41. Spec. handrail, bridges	266 l. f.	5.20	5.50	5.00
42. Porous material	9,630 c. y.	1.45	2.25	1.30
43. 8-in. corr. met. dr. pipe	5,125 l. f.	1.00	.90	1.00
44. 12-in. vitr. cl. dr. pipe	1,855 l. f.	2.00	.85	2.25
45. Remove abandoned property	L.S.	2,463.00	320.00	1.00
46. Moving crane	L.S.	700.00	1,800.00	1,000.00
47. Move L.&N.B.&B. Bldg	L.S.	1,817.00	1,800.00	1,300.00
48. Move L.&N. section house	L.S.	100.00	250.00	225.00
49. Move L.&N. water tank and Yd. office	L.S.	1,325.00	2,150.00	1,350.00
50. Move PRR 11th St. crossing gates	L.S.	400.00	600.00	350.00
51. 2½-in. stone ballast at 12th St.	1,000 c. y.	4.17	3.00	3.00
52. C. I pipe through abutments	60 l. f.	2.00	2.75	2.25
53. Cl. A conc., substr. and ret. walls	6,940 c. y.	17.00	18.00	25.00
54. 3½-in. fiber conduit, bridges	3,076 l. f.	.20	.25	.25
55. Manhole rings and covers, bridges	20 ea.	13.40	22.50	25.00

PRESSURE CULVERT PENNSYLVANIA

OWNER: U. S. Engineer Office, Baltimore, Md.

PROJECT: Construction of flood-control pressure culvert, Kingston-Edwardsville, Pa., on Toby Creek in Kingston and Pringle Boroughs, Luzerne County. Culvert 16½ ft. in diameter, 675 ft. long. Project involves construction of entrance structures, stilling basin, sidewalls, spillway, and sewer diversion.

CONDITIONS: Contractor to furnish all materials except ready-mixed concrete, crushed stone backfilling, derrick stone, crushed stone filters and 36-in. clay pipe, which is to be furnished by Government. Project to be completed in 400 days. Rail and highway transportation available. Wages on project are: skilled labor, $1.12½ to $1.50 per hr.; semi-skilled, 65 to 75c. per hr.; and common labor, 60c. per hr.

BIDS: Eight bids were received September 25, 1939, ranging from the contract low of $311,181 to $524,329. Engineer's estimate, $471,381.

LOW BIDDERS:

1. Ralph Myers, Salem, Ind. (contract) $311,181
2. J. F. Fitzgerald Constr. Co., Boston, Mass. ... 313,320
3. The Holmes Constr. Co., Wooster, Ohio 314,580

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Divert and care of water	L.S.	$9,500.00	$3,000.00	$23,658.00
2. Remove existing struct., clear site	L.S.	7,000.00	7,000.00	11,000.00
3. Maintain traffic	L.S.	500.00	1,500.00	5,000.00
4. Structure excavation	55,000 c. y.	.45	1.15	.84
5. Trench excavation	2,500 c. y.	1.50	2.00	.64
6. Stripping	17,000 c. y.	.20	.45	.50
7. Borrow excav., impervious	50,000 c. y.	.18	.35	.29
8. Borrow excav., pervious	138,000 c. y.	.16	.30	.28
9. Structure backfill	21,000 c. y.	.40	.25	.35
10. Trench backfill	2,000 c. y.	.60	.50	.40
11. Levee fill, impervious	17,000 c. y.	.18	.30	.15
12. Levee fill, pervious	145,000 c. y.	.15	.10	.15
13. Impervious blanket	28,000 c. y.	.15	.12	.15
14. Rolling, ea. add'l. trip	10,000 sq.	.02	.06	.04
15. Miscellaneous fill	15,000 c. y.	.20	.25	.40
16. Riprap (gov't.)	6,000 c. y.	1.25	2.00	3.34
17. Cr. Stone backing (gov't.)	3,200 c. y.	.60	.50	.65
18. Derrick stone (gov't.)	115 c. y.	4.00	2.00	3.00
19. Concrete (gov't., ready-mix)	7,140 c. y.	16.40	7.40	6.00
20. Reinforcing steel	1,155,000 lb.	.045	.05	.04
21 Copper water stops	2,340 lb.	.50	.60	.64
22 Bronze settlement gag. bolts	3 lb.	1.50	1.00	2.60
23. Steel pipe, settlement gages	20 l. f.	5.00	2.00	.50
24. 12-in. corr. iron pipe	70 l. f.	2.00	2.00	1.60
25. 15-in. clay pipe line	20 l. f.	3.00	.90	1.80
26. 18-in. clay pipe line	870 l. f.	2.50	1.20	2.30
27. 21-in. clay pipe line	570 l. f.	3.00	2.30	3.10
28. 24-in. cast iron pipe	250 l. f.	8.00	8.00	8.50
29. 30-in. cast iron pipe	120 l. f.	10.50	10.00	12.00
30. 36-in. clay pipe line (govt.)	500 l. f.	2.00	.50	1.90
31. Clay liner plates	850 s. f.	.60	1.00	.50
32. Iron castings	5,700 lb.	.05	.12	.08
33. Cr. stone filters (gov't.)	50 c. y.	.50	2.00	2.00

SEWERS, RHODE ISLAND

OWNER: Town of West Warwick, R. I., C. H. Carson, chairman, Sewer Commission. Jenks & Ballou, Providence, R. I., engineers.

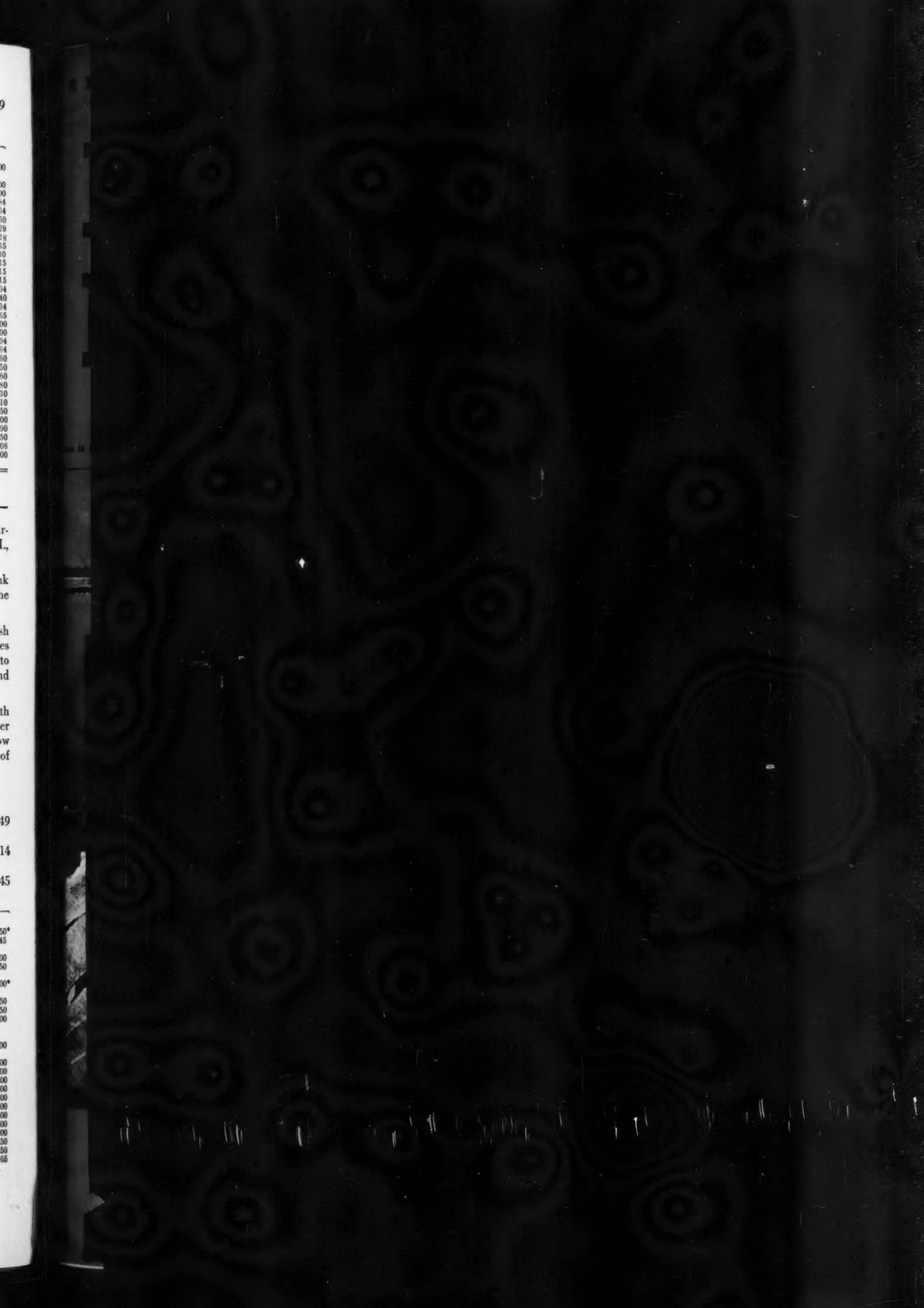
PROJECT: Constructing about 5 miles of lateral and trunk sewers in Crompton and Arctic Districts, Contract 9, in the town of West Warwick.

CONDITIONS: Contractor to furnish all materials and finish job in 200 days. Rail and highway transportation facilities available. Wage rates on the project are: skilled, $1.00 to $1.57½ per hr.; semi-skilled, 80c. to $1.00 per hr.; and common labor, 50 to 80c. per hr.

BIDS: Bids were asked September 22, 1939 on job, with alternate of concrete pipe or vitrified tile for the 15-in. sewer and fittings. Eleven bids were received, ranging from the low of $115,749 to $188,205. Contract was awarded on basis of concrete pipe to low bidder.

LOW BIDDERS:

1. DiMarco & Ciccone, Inc., White Plains, N. Y. (contract) $115,749
2. C. J. Fanning Constr. Co., Providence, R. I. (concrete) 118,814
3. I. Capaldi & Sons, Inc., Providence, R. I. (vitr. pipe) 129,545

Item	Quan.	Unit Prices (1)	(2)	(3)
1. 15-in. conc. sewer	6,830 l. f.	$4.35	$2.33	$4.50*
2. 8-in. vitr. tile sewer	28,300 l. f.	1.55	1.30	1.45
3. 16-in. c. i. sewer; trench crossing, culvert, etc	300 l. f.	6.00	7.95	6.00
4. 8-in. c. i. sew. under RR	80 l. f.	4.00	4.25	3.50
5. Capped std. sgl. 15 x 6-in. Y or T fitting, concrete	40 ea.	4.00	4.92	3.00*
6. Capped std. 2-ft. sgl. 8 x 6-in. Y or T vit. tile fitting	1,660 ea.	1.30	2.03	1.50
7. Same, 2-ft. double	100 l. f.	2.00	2.08	2.50
8. House connection chimney	400 v. f.	2.00	1.10	2.00
9. Std. or spec. 1, 2, 3, or 4-way manhole, incl. rebuilt m.h., with covers, frames, steps, etc	164 ea.	85.00	140.00	80.00
10. Std. 1, 2, 3, or 4-way drop m.h. complete as above	7 ea.	100.00	140.00	150.00
11. Excavation, test pits	50 c. y.	1.50	2.25	3.00
12. Excavation, below grade	100 c. y.	1.00	3.00	4.00
13. Rock excavation	4,000 c. y.	1.00	5.00	4.00
14. 6-in. vitr. tile underdrain	100 l. f.	1.50	2.00	1.00
15. Lumber; fndn., sheeting, shoring	50 M.b.m.	20.00	40.00	40.00
16. Cr. stone or grav.; fndn., filling	80 c. y.	3.00	3.00	3.00
17. Cl. B conc., fndn. or cradle	100 c. y.	10.00	9.68	12.00
18. Brickwork, in place	10 c. y.	35.00	25.00	25.00
19. Road resurfacing, state hwys	850 l. f.	2.00	1.40	1.50
20. Road resurfacing, town hwys	31,200 l. f.	.40	.30	.50
21. Traffic police	1,000 hr.	1.00	.60	.65

* Vitrified tile and fittings